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GLOBAL RESEARCH
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WANG, CLAIRE X	
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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/692,450
Filing Date: October 23, 2003
Appellant(s): KAPUR ET AL.

Patrick K. Patnode
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed October 30th, 2009 appealing from the Office action mailed May 29th, 2009.

(1) Real Party in Interest

General Electric Company is the real part in interest.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct except for the following rejections.

WITHDRAWN REJECTIONS

The following grounds of rejection are not presented for review on appeal because they have been withdrawn by the examiner.

- The rejection of claims 1-7 and 12-23 under 35 U.S.C. 101 is withdrawn.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

Burke et al. (US 6,421,454), Wang et al. (US 2003/0007598) and Fu et al. (US 2005/0047544)

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-3, 6 and 8-10 are rejected under 35 U.S.C. 102(b) as being anticipated by Burke et al. (US 6,421,454, B1 hereinafter "Burke").

As to claim 1, Burke teaches a method for viewing an abnormality in different kinds of images (optical correlator assisted detection for breast biopsy; Title), said method comprising: scanning an object using a first imaging system to obtain at least a first image of the object (a film scanner scans in the radiographic image into the system and registers by a coarse registration step; Col. 15, lines 7-22); determining coordinates of a region of interest (ROI) visible on the first image (a ROI can be identified by a computer aided diagnosis system; Col. 15, lines 31-32 since the ROI is identified by a computer then the coordinate must be determined), wherein the ROI includes the abnormality (system for breast biopsy; Title); and using the coordinates of the ROI to scan the object with a second imaging system (the ROI of the breast is then scanned by the ultrasonographic equipment at a high resolution setting; Col. 15, lines 42-45).

As to claim 2, Burke teaches wherein determining coordinates of the ROI visible on the first image comprises manually marking the ROI on a display device that displays the first image (the ROI is marked either manually by an operator input or by a computer aided diagnosis system; Col. 15, lines 23-35).

As to claim 3, Burke teaches wherein determining coordinates of the ROI visible on the first image comprises automatically marking the ROI by using a computer-aided design (CAD) algorithm (the ROI is marked either manually by an operator input or by a computer aided diagnosis system; Col. 15, lines 23-35).

As to claim 6, Burke teaches registering 2-dimensional (2D) data from which the first image is generated with 3-dimensional (3D) data obtained by scanning the object with the second imaging system (develop and store 3D image data set after scanning with ultrasound in higher resolution; 240 and 242 Figs. 9a-9b).

As to claims 8-10, they are the same as claims 1-3. The only difference is that Claims 8-10 are system claim, whereas claims 1-3 are method claims. Therefore, claims 8-10 are analyzed in the same way as claims 1-3. Please see above for details.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 4-5, 11-15, and 21-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Burke in view of Wang et al. (US 2003/0007598 A1 hereinafter "Wang").

As to claim 4, Burke teaches an ultrasound system wherein a probe is used (scan head probe; Col. 7, lines 9-15) and scanning the specific region of the object with the second imaging system to obtain at least one second image (the ROI of the breast is then scanned by the ultrasonographic equipment at a high resolution setting; Col. 15, lines 42-45). Wang teaches a breast cancer screening with adjunctive ultrasound mammography (Title) wherein a mechanical translation mechanism moves the ultrasound probe across the breast as ultrasound scans are taken ([0030], lines 7-9). Thus, Wang reads on the claimed instructing a probe mover to move a probe to the co-ordinates to scan a specific region of the object. Therefore, it would have been obvious for one ordinarily skilled in the art at the time the invention was made to combine Burke's ultrasound system with the mechanical probe mover in order to accurately move the ultrasound probe to the desired location.

As to claim 5, Wang teaches displaying the first and the second images concurrently to enable a user to view the abnormality (the ultrasound display has one or more adjunct display monitors positioned near the x-ray mammogram display so the radiologist is able to view both at the same time; [0033], lines 7-13).

As to claim 11, it is the system claim of claim 4. Therefore, it is analyzed in the same way. Please see above for detail analysis.

As to claim 12, it differs from claim 1 in that claim 12 further teaches registering 3-dimensional (3D) data relative to 2-dimensional (2D) data, wherein the 3D data is obtained using the second imaging system and the 2D data is obtained using the first imaging system. Wang teaches scanning the ROI using both X-ray and ultrasound wherein the X-ray is the 2D data generator and the ultrasound is the 3D image generator ([0044], lines 1-8). Thus, Wang reads on the claimed registering 3D image data with the second system and the 2D image data with the first system. Therefore, it would have been obvious for one ordinarily skilled in the art at the time the invention was made to combine the 2 system of Burke with the 2D and 3D systems of Wang, Since it's well known in the art that X-ray is capable of generating 2D images and ultrasound is capable of generating 3D images.

As to claim 13, Wang teaches wherein registering 3D data relative to 2D data comprises registering 3D data relative to 2D data without using fiducial marks on a patient having the abnormality (correlating the ROI using nipple distance information; [0044], lines 10-19).

As to claim 14, Wang teaches wherein registering 3D data relative to 2D data comprises registering 3D data acquired using an ultrasound imaging system relative to 2D data acquired using an X-ray imaging system (Wang teaches scanning the ROI using both X-ray and ultrasound wherein the X-ray is the 2D data generator and the ultrasound is the 3D image generator; [0044], lines 1-8).

As to claim 15, Wang teaches establishing a relationship between the 3D data acquired using the ultrasound imaging system and the 2D data acquired using the X-ray imaging system (Wang teaches scanning the ROI using both X-ray and ultrasound wherein the X-ray is the 2D data generator and the ultrasound is the 3D image generator; [0044], lines 1-8).

As to claim 21, it is the combination of claims 1 and 4. Thus it is analyzed in the same way. Please see above for detail analysis.

As to claim 22, it is the same as claim 2. Therefore, claim 22 is analyzed in the same way as claim 2.

As to claim 23, it is the same as claim 3. Therefore, claim 23 is analyzed in the same way as claim 3.

As to claim 24, it is the same as claim 21. The only difference is that Claim 24 is a system claim, whereas claim 21 is a method claim. Therefore, claim 24 is analyzed in the same way as claim 21.

As to claim 25, it is the same as claim 21. The only difference between the two claims is claim 25 fails to teach the scanning and determining coordinates part of claim 21. Also, claim 25 is a system whereas claim 21 is a method.

Claims 7, 16, 20 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Burke in view of Fu et al. (US 2005/0047544 A1 hereinafter “Fu”).

As to claim 7, Fu teaches the differences in the position and orientation of the anatomical target images within radiographs correspond to the difference in the 3D position with in a target 3D coordinate frame are solved by finding the parameters (s, y, z, r, p, w). Thus Fu’s parameters read on the claimed 6 unknowns. Therefore, it would have been obvious to one ordinarily skilled in the art at the time of the invention to combine Burke's radiographic and ultrasound system with Fu’s correlation parameters in order to have a precise and rapid way to register 2D images with 3D scan data (Fu [0009] lines 1-3).

As to claim 16, it is the same as claim 7. The only difference between the two claims is claim 16 further teaches that 2D data is gathered using an X-ray and the 3D data is gathered using an ultrasound (Burke teaches develop and store 3D image data set after scanning with ultrasound in higher resolution; 240 and 242 Figs. 9a-9b). Therefore, claim 16 is analyzed in the same way as claim 7.

As to claim 20, Fu teaches obtaining six additional equations having six additional unknowns, wherein each of the six additional equations establishes a relationship between coordinates of 2D data acquired from the X-ray imaging system and coordinates of 3D data acquired from the ultrasound imaging system; solving the six additional equations to obtain the six additional unknowns; and averaging a first unknown of the six unknowns with a corresponding first additional unknown of the six additional unknowns (Fig. 3 shows the different ways of finding an relating the 6 unknowns through multi-dimensional matching).

As to claim 26, it is the system claim of 7. Therefore, claim 26 is analyzed in the same way as claim 7.

Allowable Subject Matter

Claims 17-19 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Regarding claim 17, the innovation distinction that makes the claim allowable is the three equations defined by the claim.

(10) Response to Argument

Section 102 rejection of claims 1-3, 6, and 8-10

Appellant's argue that Burke does not teach scanning an object using a first imaging system to obtain at least a first image of the object; determining coordinates of a ROI visible on the first image, wherein the ROI includes the abnormality; and using the coordinates of the ROI to scan the object with a second imaging system (Brief 17, paragraph 2).

Appellants have not responded to Examiner's finding that col. 17, lines 7-22 of Burke discloses a film scanner that scans in the radiographic image into the system, which corresponds to "scanning an object using a first imaging system to obtain at least a first image of the object" as recited in claim 1. Appellants have provided no evidence to show error in this interpretation. Appellants have merely misquoted sections of Burke, then alleged without proof that Burke does not disclose the elements of claim 1.

Appellants have not responded to Examiner's finding that col. 17, lines 31-32 discloses "determining coordinates of a region of interest visible on the first image." Appellants appear to allege that Burke does not disclose "determining coordinates" because this section of Burke does not use the words "determining coordinates" (Brief 18). However, Burke discloses that the region of interest can be defined by identifying the ROI with a computer aided diagnosis system. Col. 15, ll. 23-35. The region of interest is identified using coordinates from the coordinate system shown in figures 2 and 3. Figs. 2 and 3; col. 6, l. 21 to col. 7, l. 37. The claim term "determining coordinates of a region of interest visible on the first image" encompasses identifying a region of interest as discussed in col. 15, ll. 23-35 using the coordinate system shown in figures 2 and 3 and discussed at col. 7, ll. 27-37. Appellants have not provided an explicit definition of the claim term "determining coordinates" that excludes Examiner's interpretation.

Appellants have not responded to Examiner's finding that the title discloses that the region of interest includes the abnormality. The abstract of Burke further describes that the imaging of Burke is for imaging small calcifications, which corresponds to the claimed "abnormality." Appellants have provided no evidence to rebut this interpretation.

Appellants have not responded to Examiner's finding that col. 15, lines 42-45 of Burke discloses "using the coordinates of the ROI to scan the object with a second imaging system." Burke discloses that the ROI in the mammogram that is identified after the coarse registration step is then scanned by the ultrasound equipment, which corresponds to "using the coordinates of the ROI to scan the object with a second imaging system." Appellants have not provided any evidence to rebut this interpretation.

Burke discloses identifying a ROI using a CAD system after the system registers the coarse images of the breast (Burke Col. 15, lines 23-35), and then the corresponding ROI in the actual breast is rescanned in order to obtain an image of the ROI at a higher resolution (Burke Col. 15, lines 35-46). The ROI did not exist until the identification using the CAD system (Burke Fig. 9a); therefore to rescan the same ROI in the actual breast, the coordinates of the ROI must be known. Burke discloses extracting the targeting coordinates of calcifications, then passing the coordinates to a second instrument and then using the coordinates to guide the instrument to the target calcification (Burke Col. 18, lines 13-23). Burke therefore discloses using the identified coordinates of a ROI to guide an instrument in order to perform a procedure on the ROI.

Section 103 rejection of claims 4-5, 11-15, and 21-25

Appellants recite the elements of claims 1, 8, 12, 21, and 24, then argues that the combination of Burke and Wang does not disclose the elements of these independent claims, and conclude that the corresponding dependent claims are allowable because the independent claims are allowable (Brief 23-25). However, Examiner has shown where Burke discloses the elements of the independent claims in the final rejection. Wang is used to address the limitations of the dependent claims as explained in the final rejection. Appellants have failed to address this rejection.

Simply pointing out what a claim requires with no attempt to point out how or why the claims patentably distinguish over the prior art does not amount to a separate argument for patentability. 37 C.F.R. § 41.37(c)(1)(vii) (2004). *See also In re Nielson*, 816 F.2d 1567, 1572 (Fed. Cir. 1987).

Further, Appellants argues that Wang does not appear to disclose that coordinates of an ROI, as determined using a first system, are used to scan the object with a second imaging system. However, Examiner is relying on Burke to teach this claim element.

Section 103 rejection of claims 7, 16, 20, and 26

Appellants recite the elements of claims 1, 8, 12, 21, and 24, then allege that the combination of Burke and Fu does not disclose the elements of these independent claims, and conclude that the corresponding dependent claims are allowable because the independent claims are allowable (Brief 25-26) However, Examiner has shown where Burke discloses the elements of the independent claims in the final rejection. Fu is used to address the limitations of the dependent claims as explained in the final rejection. Appellants have failed to address the rejection.

Simply pointing out what a claim requires with no attempt to point out how or why the claims patentably distinguish over the prior art does not amount to a separate argument for patentability. 37 C.F.R. § 41.37(c)(1)(vii) (2004). *See also In re Nielson*, 816 F.2d 1567, 1572 (Fed. Cir. 1987).

In response to Appellant's argument that Fu does not appear to disclose that coordinates of an ROI, as determined using a first system, are used to scan the object with a second imaging system, it is noted that the Examiner is relying on Burke to teach the above step.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/Claire X. Wang/

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